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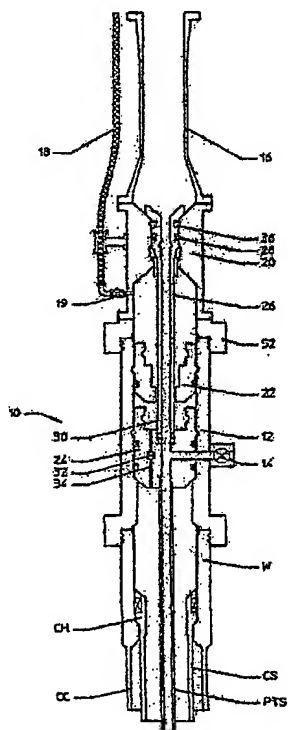
PCT

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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
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[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR WELL WORKOVER WITH HORIZONTAL TREE



(57) Abstract: A workover system (10) for use with a subsea horizontal tree provides an economical solution when it is not necessary to pull the production tubing out of the well and/or when a subsea drilling BOP is not required. The system utilizes a riser (16) and riser adaptor (20). An annulus flow line (18) for connection to the annulus is provided with the riser. The workover system is adaptable to multiple configurations for connecting the lower end of the annulus flow line to the subsea horizontal tree for communication with the annulus. For instance, the annulus flow line may be connected to the adapter, or may be connected between the well cap (12) and tubing hanger (24), or below the tubing hanger. An isolation sleeve (26) may or may not be utilized in various embodiments and may be constructed for sealing and/or latching with different components depending on the embodiment. One or more control valves (14) for the annulus flow may be provided in several different/alternative positions including within the tubing hanger and outside of the subsea horizontal tree.

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PATENT COOPERATION TREATY

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference DQIP-146-PCT	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US03/28876	International filing date (<i>day/month/year</i>) 12 September 2003 (12.09.2003)	(Earliest) Priority Date (<i>day/month/year</i>) 12 September 2002 (12.09.2002)
Applicant DRIL-QUIP, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No. 1



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/28876

Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

NEW ABSTRACT

A workover system (10) for use with a subsea horizontal tree provides an economical solution when it is not necessary to pull the production tubing out of the well and/or when a subsea drilling BOP is not required. The system utilizes a riser (16) and riser adaptor (20). An annulus flow line (18) for connection to the annulus is provided with the riser. The workover system is adaptable to multiple configurations for connecting the lower end of the annulus flow line to the subsea horizontal tree for communication with the annulus. For instance, the annulus flow line may be connected to the adapter, or may be connected between the well cap (12) and tubing hanger (24), or below the tubing hanger. An isolation sleeve (26) may or may not be utilized in various embodiments and may be constructed for sealing and/or latching with different components depending on the embodiment. One or more control valves (14) for the annulus flow may be provided in several different/alternative positions including within the tubing hanger and outside of the subsea horizontal tree.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/28876

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : E21B 29/12

US CL : 166/368, 348, 338, 344, 88.1, 95.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 166/368, 348, 338, 344, 88.1, 95.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,053,252 A (EDWARDS) 25 April 2000 (25.04.2000), see figures 1-3 and 5.	1-23
X, E	US 6,675,900 B (BAKETT et al) 13 June 2004 (13.01.2004), see all figures.	1-23
A, E	US 6,719,059 B (DEZEN et al) 13 April 2004 (13.04.2003), see whole document.	1-23
A, E	6,755,254 B (DEBERRY) 29 June 2004 (29.06.2004), see whole document.	1-23
A	US 5,544,707 A (HOPPPER et al) 13 August 1996 (13.08.1996), see whole document.	1-23

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

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03 NOV 2004

Name and mailing address of the ISA/US

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